

13. A cooktop, comprising:

- a) one or more gas burners;
- b) one or more gas valves, each of said valves being connected to control gas flow to one of said gas burners;
- c) a user interface for user entry of burner heating level for each of said one or more gas burners, wherein a lowest portion of burner heating levels corresponds to a flame "on/off" sequencing mode of flow settings of said one or more gas valves;
- d) a controller operative to control each of said one or more gas valves in accordance with said user entry entered for the corresponding one of said one or more gas valves;
- e) one or more igniters, each of said igniters being connected to ensure ignition of the gas delivered to the said gas burners; and
- f) one or more temperature sensors, each of said sensors being connected and placed to monitor the presence of flames at each of the said burners.

18. (Amended) A cooktop as in claim 13, wherein said user interface comprises a multiplicity of touch-sensitive pads operable to select burner heating levels in a predetermined set of user-selectable steps.

26. (Amended) A heating device as recited in claim 25, wherein said first electronically controlled mechanism is capable of providing 30 different on-levels of gas flow.

27. (Amended) A heating device as recited in claim 25, wherein a flame is produced at said burner, wherein said electronic controller is capable of controlling said second mechanism for sequencing the flame on and off at a predetermined level of flame.
28. (Amended) A heating device as recited in claim 27, wherein said controller comprises a microcontroller, wherein sequencing the flame on and off is controlled by said microcontroller.
29. (Amended) A heating device as recited in claim 28, wherein said microcontroller further comprises a pulse width modulation output port and an A/D converter.
30. (Amended) A heating device as recited in claim 27, wherein sequencing the flame on and off is controlled by time.
31. (Amended) A heating device as recited in claim 27, wherein sequencing the flame on and off is accomplished with the on level set to a predetermined medium level of flame or with the on level set to a medium-low level of BTU output.
32. (Amended) A heating device as recited in claim 27, wherein sequencing the flame on and off is accomplished with gas flow on and off for time periods to correspond to a desired simmer level.
33. (Amended) A heating device as recited in claim 25, wherein said controller uses pulse-width-modulation for controlling said first mechanism.
34. (Amended) A heating device as recited in claim 25, further comprising an igniter, wherein said igniter assures flame re-ignition when said second mechanism is used.

35. (Amended) A heating device as recited in claim 34, wherein said igniter does not need to be synchronized with flame on/off cycling during simmer mode
36. (Amended) A heating device as recited in claim 35, wherein said igniter is continuously powered when said second mechanism is used.
37. (Amended) A heating device as recited in claim 34, wherein said igniter comprises a resistive hot-surface igniter.
38. (Amended) A heating device as recited in claim 37, wherein said igniter comprises a ceramic hot-surface igniter capable of constant re-ignition
39. (Amended) A heating device as recited in claim 25, further comprising a main in-line solenoid safety valve.
40. (Amended) A heating device as recited in claim 25, further comprising a plurality of burners, wherein said device comprises one of said first electronically controlled mechanisms and one of said second electronically controlled mechanisms for each said burner.
41. (Amended) A heating device as recited in claim 25, wherein said first mechanism comprises a variable orifice solenoid that has a plurality of positions controlled by application of a voltage signal.
42. (Amended) A heating device as recited in claim 25, wherein a single gas valve includes both said first electronically controlled mechanism and said second electronically controlled mechanism.

43. (Amended) A heating device as recited in claim 25, further comprising an igniter for igniting gas when said first electronically controlled mechanism provides flow of gas.
44. (Amended) A heating device as recited in claim 43, wherein said igniter is a hot-surface igniter.
45. (Amended) A heating device as recited in claim 43, further comprising an igniter for igniting gas when said first electronically controlled mechanism and said second electronically controlled mechanism provides flow of gas.
46. (Amended) A heating device as recited in claim 45, wherein said igniter is set to be on continuously when said second electronically controlled mechanism is being used to stop and start flow of gas to said burner.
47. (Amended) A heating device as recited in claim 43, further comprising a circuit to monitor ignition by sensing temperature or sensing current flowing in said igniter.
48. (Amended) A heating device as recited in claim 25, further comprising a user interface.
49. (Amended) A heating device as recited in claim 48, wherein said user interface comprises a dial control.
50. (Amended) A heating device as recited in claim 48, wherein said user interface comprises touch switches.
51. (Amended) A heating device as recited in claim 50, wherein said touch switches comprises a touch pad.

52. (Amended) A heating device as recited in claim 48, wherein said user interface comprises a capacitive touch keyboard.
53. (Amended) A heating device as recited in claim 48, wherein said user interface comprises a power key, an on key, power level control keys, and an off key.
54. (Amended) A heating device as recited in claim 25, further comprising a digital visual display of cooking level of each burner.
55. (Amended) A heating device as recited in claim 54, wherein said digital visual display comprises an LED, LCD, or a vacuum fluorescent display
56. (Amended) A heating device as recited in claim 25, further comprising a temperature sensor fixed to a burner base.
57. (Amended) A heating device as recited in claim 56, further comprising an igniter and a circuit to detect current flowing in said igniter, wherein if no current flows in said igniter or no elevated temperature is sensed with said temperature sensor then visual and audible alarms are generated.
58. (Amended) A gas valve comprising a first electronically controlled flow control mechanism and a second electronically controlled flow control mechanism of a different type from said first electronically controlled flow control mechanism, wherein both said first electronically controlled flow control mechanism and said second electronically controlled flow control mechanism can be used together to provide less gas than said first electronically controlled flow control mechanism can provide alone while providing more than zero gas.


- Q3 59. (Amended) A method of heating comprising the steps of electronically energizing an igniter, electronically setting a level to a modulating valve, and electronically setting a time based sequencer to provide a selected BTU output level.

Please add the following new claims

61. A heating device as recited in claim 25, further comprising a main in-line valve for closing off flow if a fault condition occurs.
62. A heating device as recited in claim 61, further comprising an igniter, wherein said igniter is de-energized if a fault condition occurs.
63. A cooktop as in claim 13, further comprising a main in-line solenoid safety valve.
- Q4 64. A device for controlling flow of a fluid, comprising:
- an electronic controller, a first mechanism and a second mechanism, said electronic controller for electronically controlling said first mechanism and said second mechanism;
- said first electronically controlled mechanism for controlling flow of fluid capable of providing at least two different on-levels of continuous fluid flow; and
- said second electronically controlled mechanism capable of stopping and starting flow of fluid, wherein combination of said first mechanism and said second mechanism provides capability to achieve a lower quantity of fluid over time than is achievable with just continuous flow of fluid from said first mechanism.
65. A device as recited in claim 64, wherein said fluid comprises gas.

66. A device as recited in claim 65, wherein said first electronically controlled mechanism is capable of providing any intermediate level of gas flow.
67. A device as recited in claim 65, wherein said first electronically controlled mechanism is capable of providing 30 different on-levels of gas flow.
68. A device as recited in claim 65, wherein said electronic controller is capable of controlling said second mechanism for sequencing flow on and off at a predetermined level.
69. A device as recited in claim 68, wherein said controller comprises a microcontroller, wherein sequencing fluid flow on and off is controlled by said microcontroller.
70. A device as recited in claim 69, wherein said microcontroller further comprises a pulse width modulation output port and an A/D converter.
71. A device as recited in claim 68, wherein sequencing the flow on and off is controlled by time.
72. A device as recited in claim 68, wherein sequencing the flow on and off is accomplished with the on level set to a medium-low level.
73. A device as recited in claim 68, wherein sequencing the flow on and off is accomplished with gas flow on for 1 second and off for 8 seconds.
74. A device as recited in claim 64, wherein said controller uses pulse-width-modulation for controlling said first mechanism.

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75. A device as recited in claim 64, further comprising a main in-line solenoid safety valve.
76. A device as recited in claim 64, wherein said first mechanism comprises a variable orifice solenoid that has a plurality of positions controlled by application of a voltage signal.
77. A device as recited in claim 64, wherein said fluid comprises gas and wherein a single gas valve includes both said first electronically controlled mechanism and said second electronically controlled mechanism.
78. A device as recited in claim 64, further comprising a user interface.
79. A device as recited in claim 78, wherein said user interface comprises a dial control.
80. A device as recited in claim 78, wherein said user interface comprises touch switches.
81. A device as recited in claim 80, wherein said touch switches comprises a touch pad.
82. A device as recited in claim 78, wherein said user interface comprises a capacitive touch keyboard.
83. A device as recited in claim 78, wherein said user interface comprises a power key, an on key, power level control keys, and an off key.



84. A device as recited in claim 64, further comprising a digital visual display of flow.

85. A device as recited in claim 84, wherein said digital visual display comprises an LED, LCD, or a vacuum fluorescent display

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